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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TURNER, SAMUEL A	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/725,261	BRASEN ET AL.	
	Examiner	Art Unit	
	Samuel A. Turner	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Title

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Abstract

The abstract of the disclosure is objected to because of legal phraseology. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 is drawn to "a method for fine-controlling the position of a predetermined probe location relative to a fixed reference point of a probe processing apparatus fixedly coupled to an auxiliary optical laser apparatus" but only contains means-plus-function limitations to the probe processing apparatus. The claims do not further the method as there are no method steps claimed. For purposes of the following rejection claims 7-9 will be treated as apparatus claims.

Claim Rejections - 35 USC § 103

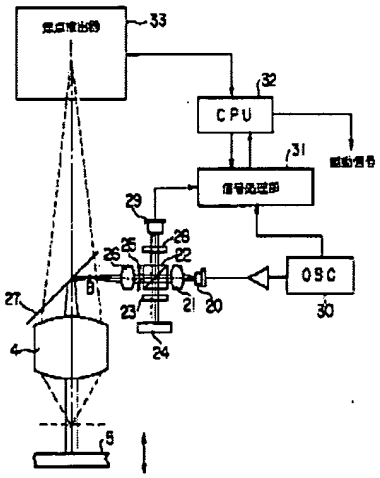
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al(JP 10090591 A) in view of Erickson(3,601,490).

【図1】



With regard to claim 1, Yamagishi et al teach a method for fine-controlling the position of a predetermined probe location relative to a fixed reference point of a probe processing apparatus fixedly coupled to an auxiliary optical laser apparatus, in which method the position is controlled with optical means, comprising the steps of:

presetting said probe location position within a predetermined converging range(**the range is set to a specific count value, abstract**);

Splitting(**by polarizing beam-splitter 22**) said positioning laser beam(**from laser 20**) having a linear polarity into a probe beam(**toward object 5**) and a reference beam(**toward reference mirror24**), whereby a respective optical beam splitting means represents said fixed reference point;

polarizing said probe beam and said reference beam in different directions to each other(**by polarizing beam-splitter 22 and λ/4 waveplates 23 and 25**);

recombining a beam reflected from said probe location with said reference beam(**by polarizing beam-splitter 22**).

detecting a frequency difference between said reflected beam and said reference beam(**count value m by detector 29**); and

fine-controlling a table supporting said probe(**object 5 is moved until the measured count value m is equal to the saved count value**).

Yamagishi et al fail to teach presetting said probe location position within a predetermined converging range of 1/4 of the wave length of the applied fine-controlling positioning laser beam;

detecting a phase difference between said reflected beam and said reference beam; and

fine-controlling a table supporting said probe, such that the detected phase difference is minimum.

As to claim 2, Yamagishi et al teach the angle between the polarization of the incoming laser beam and the polarization direction of said reference beam or the probe beam, respectively, is 45.degree(by conventional polarizing beam-splitter 22).

As to claim 3, Yamagishi et al fail to teach in which the angle between the polarization of the incoming laser beam and the polarization direction of said reference beam or the probe beam, respectively, is selected such that the intensities of reflected probe beam and reference beam when entering the phase detection means are equal.

As to claim 4, Yamagishi et al fail to teach repeating continuously the claimed steps of claim 1 for a plurality of probe locations while scanning a continuous portion of a probe surface.

As to claim 5, Yamagishi et al fail to teach wherein said auxiliary optical laser apparatus performs a fine-controlled auto-focusing of a laser beam associated with said probe processing apparatus.

As to claim 6, Yamagishi et al teach that said auxiliary optical laser apparatus contributes to perform a fine-focusing of a microscope apparatus(4) acting as said probe processing apparatus(the measured count value m is equal to the saved count value).

With regard to claim 7, Yamagishi et al teach an apparatus for fine-controlling the position of a predetermined probe location relative to a fixed reference point of a probe processing apparatus fixedly coupled to an auxiliary optical laser apparatus, said apparatus comprising:

means for presetting said probe location position(initial count value m);

means for splitting said positioning laser beam having a linear polarity into a probe beam and a reference beam, whereby a respective optical beam splitting means represents said fixed reference point(22);

means for polarizing said probe beam and said reference beam in different directions to each other(22,23,25);

means for recombining a beam reflected from said probe location with said reference beam(22);

means for detecting a frequency difference between said reflected beam and said reference beam(29); and

means for fine-controlling a table supporting said probe(5,32).

Yamagishi et al fail to teach means for presetting said probe location position within a predetermined converging range of 1/4 of the wave length of the applied

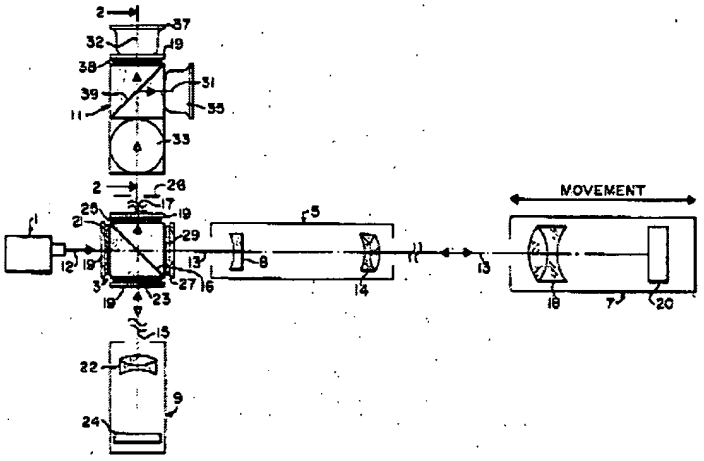
fine-controlling positioning laser beam;

means for detecting a phase difference between said reflected beam and said reference beam; and

means for fine-controlling a table supporting said probe, such that the detected phase difference is minimum.

As to claim 8, Yamagishi et al teach that said means for splitting comprises a polarizing beam splitter(22).

As to claim 9, Yamagishi et al fail to teach wherein said means for detecting said phase difference comprises: either a quarter-wave-plate or a Babinet-Soleil-Compensator for modifying the polarity of said recombined beam; a polarizing beam splitter post-connected thereto; and a pair of photo detection means, sensing the respective intensity of the split beams for control purposes.



Erickson teach a laser interferometer comprising: a linearly polarized source(1); a λ/2 waveplate(21) which controls the orientation of the linearly

polarized light from the source; a polarizing beam-splitter(27); a measurement arm including a measurement beam(13), λ/4 waveplate(29), and mirror(20); a reference arm including a reference beam(15), λ/4 waveplate(23), and mirror(24); and a detector arrangement including a λ/4 waveplate(25), a polarizing beams-splitters(34,39), polarizer(38) and detectors(33,35,37) which detect a phase difference between the detectors based on the displacement of the measurement arm mirror.

With specific regard to claim 1, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the interferometer of Erickson for the heterodyne interferometer of Yamagishi because the use of the single frequency source would simplify the detection of displacement since a phase difference is easier to detect then a frequency difference. With regard to the step of presetting said probe location to a range of 1/4 of the wave length of the laser beam, because the accuracy of a phase difference measuring interferometer is λ/4 of the light source this would be the range of the desired focal point and merely a matter of finding the optimum range for the focal point. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. With regard to the step of fine-controlling such that the detected phase difference is minimum, Yamagishi et al teach adjusting the object 5 until the measured count value is equal to the stored or preset count value, thus zeroing the count difference

which is the minimum value. With the phase measuring interferometer of Erickson one would drive the object until the distance between the preset position and the measured position are the same, which would be a minimum phase difference between the detected signals.

With specific regard to claims 2 and 3, the polarizing beam-splitter(PBS) 22 of Yamagishi is a 50% PBS which splits the intensity equally between the test and reference beams. Erickson uses the λ/2 waveplate 21 to control the input polarization angle to the 50% PBS 27 thus controlling the intensity between the measurement and test beams, thereby improving the signal-to-noise ratio because the final intensities, at the detectors, between the two beams are equal due to the differing path lengths. It would have been obvious to one of ordinary skill in the art at the time the invention was made control the input polarization angle to any value in order to control the intensities between the test and reference beams such that at the detectors the intensities are equal. This improves the signal-to-noise ratio.

With specific regard to claim 4, Yamagishi et al teach only an initial positioning and thereafter a conventional system in the microscope tracks the focusing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Yamagishi apparatus to continuously monitor the focus position of the microscope since the interference system is more accurate

than the conventional system. The repetition of known steps which repeat the same functions involves only routine skill in the art.

With specific regard to claims 5 and 6, the kind of beam for which the focusing is controlled would have been a mere matter of intended use and it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teachings of Yamagishi to any focusing system having any light source.

With specific regard to claim 7, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the interferometer of Erickson for the heterodyne interferometer of Yamagishi because a single frequency source would simplify the detection of displacement since a phase difference is easier to detect then a frequency difference. With regard to the means for presetting said probe location to a range of 1/4 of the wave length of the laser beam, because the accuracy of a phase difference measuring interferometer is $\lambda/4$ of the light source this would be the range of the desired focal point and merely a matter of finding the optimum range for the focal point. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. With regard to the means for fine-controlling such that the detected phase difference is minimum, Yamagishi et al teach that the CPU 32 controls the object 5 until the measured count value is equal to the stored or preset count value,

thus zeroing the count difference which is the minimum value. With the phase measuring interferometer of Erickson one would drive the object until the distance between the preset position and the measured position are the same, which is a minimum phase difference between the detected signals.

With specific regard to claim 9, the λ/4 waveplate, polarizing beams-splitter, and detectors are part of a conventional phase difference interferometer detection arrangement, as found in Erickson. The combination of Yamagishi and Erickson found in claim 1 would meet the limitations of claim 9.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is **571-272-2432**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on **571-272-2800 ext. 77**.

The fax phone number for the organization where this application or proceeding is assigned is **703-872-9306**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see **http://pair-direct.uspto.gov**. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).

Samuel A. Turner
Primary Examiner
Art Unit 2877